Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A method for assessing an ice ball formation during the cryoablation of a target tissue in the vasculature of a patient, said method comprising the steps of:

providing a cryocatheter having a cryotip wherein said cryotip includes an expansion chamber;

contacting said patient with a reference electrode;

positioning said cryotip proximate said target tissue;

measuring a first impedance between said cryotip and said reference electrode;

cooling said cryotip by expanding a refrigerant in said expansion chamber;

measuring a second impedance between said cryotip and said reference electrode after said cooling step; [[and]]

determining a ratio of said first impedance to said second impedance to assess the formation of an ice ball and an extent of the cryoablation of target tissue[[.]]; and

expanding said refrigerant in said expansion chamber until a ratio of two measured impedances is substantially zero.

2. (Original) A method as recited in claim 1 wherein said first and second impedance are measured using a signal having a frequency of approximately 20khz.

3. (Original) A method as recited in claim 2 wherein said signal has an RMS voltage of approximately 0.5V.

4. (Previously Presented) A method as recited in claim 1 wherein said first and second impedance are measured using a signal and said signal is produced by:

generating a square wave;

converting said square wave to a sine wave using a four pole, low pass, active filter; and

rectifying said sine wave using a plurality of analog switches driven by a 20khz signal that is phase shifted relative to said sine wave by approximately 90 degrees.

Claims 5 and 6 (Canceled)

7. (Original) A method as recited in claim 6 wherein said refrigerant is expanded in said expansion chamber after said ratio of two measured impedances is substantially zero.

8. (Original) A method as recited in claim 1 wherein said reference electrode is a backplate.

9. (Currently Amended) A method for assessing an ice ball formation during the cryoablation of a target tissue of a patient, said method comprising the steps of:

contacting the patient with a reference electrode;

providing a cryocatheter having a cryotip wherein said cryotip includes an expansion chamber;

cooling said cryotip by expanding a refrigerant in said expansion chamber to create an ice ball and cryoablate said target tissue;

generating a measurement signal having a frequency in the range of 15 to 25khz and an RMS voltage of less than 1.0V; [[and]]

using said measurement signal to measure a current between said cryotip and said reference electrode to assess the formation of said ice ball[[.]]; and

expanding said refrigerant in said expansion chamber until said current is substantially zero.

10. (Original) A method as recited in claim 9 wherein said measurement signal is generated by:

producing a square wave;

converting said square wave to a sine wave using a four pole, low pass, active filter; and

rectifying said sine wave using a plurality of analog switches driven by a signal that is phase shifted relative to said sine wave by approximately 90 degrees.

Claims 11 and 12 (Canceled)

13. (Original) A method as recited in claim 11 wherein said refrigerant is expanded in said expansion chamber after said current is substantially zero.

14. (Original) A method as recited in claim 9 wherein said reference electrode is a backplate.

15. (Currently Amended) A system for assessing ice ball formation during the cryoablation of a target tissue of a patient, said system comprising:

a reference electrode for contacting said patient;

a cryocatheter having a cryotip wherein said cryotip includes an expansion chamber;

a means for positioning said cryotip proximate said target tissue;

a means for cooling said cryotip by expanding a refrigerant in said expansion chamber to create an ice ball and cryoablate said target tissue; and

an electronic means connected to said cryotip and said reference electrode to measure an impedance therebetween to assess formation of said ice ball and to allow for expanding said refrigerant in said expansion chamber until a ratio of two measured impedances is substantially zero.

16. (Original) A system as recited in claim 15 wherein said electronic means measures said impedance using a signal having a frequency of approximately 20khz.

17. (Original) A system as recited in claim 16 wherein said signal has an RMS voltage of approximately 0.5V.

18. (Original) A system as recited in claim 15 wherein said electronic means comprises:

a means for generating a square wave;

a four pole, low pass, active filter for converting said square wave to a sine wave; and

a plurality of analog switches, said switches for rectifying said sine wave driven by a 20khz signal that is phase shifted relative to said sine wave by approximately 90 degrees.

19. (Original) A system as recited in claim 15 wherein said cryotip is formed with an expansion chamber and said means for cooling said cryotip includes a means for expanding a refrigerant in said expansion chamber.

20. (Original) A system as recited in claim 15 wherein said reference electrode is a backplate.

21. (Currently Amended) A method for assessing contact between a cryotip of a cryocatheter and a target tissue in the vasculature of a patient, said method comprising the steps of:

contacting said patient with a reference electrode;

positioning said cryotip proximate said target tissue;

measuring a first impedance between said cryotip and said reference electrode;

moving said cryotip relative to said target tissue;

measuring a second impedance between said cryotip and said reference electrode after said moving step; and

determining a ratio of said first impedance to said second impedance wherein said first and second impedance are measured using a signal having a frequency of approximately 20khz and an RMS voltage of approximately 0.5V and said signal is produced by generating a square wave, then converting said square wave to a sine wave using a four pole, low pass, active filter, and rectifying said sine wave using a plurality of analog switches driven by a 20khz signal that is phase shifted relative to said sine wave by approximately 90 degrees to assess contact between said cryotip and said target tissue.

Claims 22-24 (Canceled)